Making Life Safer
Part 3

by

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This is a long read (about 12 pages). You may prefer to download its PDF and read it at your leisure. You can download the PDF at: http://wcart.net/articles.

In Part 1 you were challenged with what action you will take to protect yourself, loved ones, and community. Part 2 discussed the outermost perimeter defense that communities have and use. This part emphasized how easy it is to breach these defenses.

As mentioned in Part 2, once a community's choke points of a have been circumvented or breached, the land that your house sits on is your next perimeter defense area.

Typically two types of defenses are used to "secure" your home and land.

1. Fencing
2. Detectors

Fencing

Many homeowners install some sort of fencing on their property the back yard. The two primary reasons are to keep dogs in an enclosed area, and to provide a "safe" area for children to play. In communities that have homeowner associations (HOAs) there are often restrictions as to what can be fenced in and what type of fence and materials can be installed. The problem with such restrictions is that the authors who wrote them are looking only at the aesthetics for a community and do not consider any security aspects. Consequently most fences are between 4-6 feet tall. The most common material used in fencing is 4 foot high chain-link fencing. Six foot fences are usually made of wood panels designed to block a neighbor's view of the backyard.

Four foot high fences are easy to climb over and equally easy to pass stolen goods over, especially if they are rail and post fences.

Six foot fences are harder to climb but often have unsecured gates that provide intruders with the same easy entry and exit as 4 foot fences. Generally 6 foot fences are constructed using wood panels, or they are made of rigid metal bars, tubes or rods. The wooden fences provide privacy while the metal ones allow people to see into the property behind the fence. The metal fence look a lot like the fence surrounding our White House in Washington DC.

Regarding 6 foot wood panel fences, you need to make sure that the installers DO NOT use nails to construct the fence Instead use at least 2-1/2 inch long screws designed for outdoor use. There are two reasons for using screws instead of nails:

1. Nails deteriorate faster than screws
2. Screws hold better than nails, especially when intruders try to kick out the boards that are screwed to the fence frame.

To increase the intrusion deterrence capability of fences, plant thorny type shrubs on at least the outside of the fence (both sides is more preferable). Of course you could install concertina wire but this has three disadvantages:

1. It is ugly compared to shrubbery.
2. It may deter some intruders, but it sends a message to others that there may be some really valuable on the other side of the fence.
3. With the way our legal system is, you may actually be charged with intent to do bodily harm or worse.

Detectors

Intrusion detectors come in different formats:

- Motion
- Trip
- Pressure
- Heat
- Magnetic

Motion detectors, by far, are the most common detectors used around homes today. There are five different classifications of motion detectors on the market today. They are namely PIR, Ultrasonic, Microwave, Tomography, and combined types. Each has its own pros and cons.

Within each classification, the detectors will either:

- Turn on lights,
- Sound an audible alarm,
- Notify homeowner and/or security of an intrusion, or
- A combination of the above

Typically they will be designed for specific indoors or outdoors uses. For outdoor use they are either mounted on walls or used as driveway monitors.

These detectors are powered by electricity, batteries, or solar. They vary in price, quality, and lifespan.

Driveway monitors are typically battery operated (both detector and indoor monitoring device). There are also solar powered detectors such as the *eMarcros Driveway Alarm System*, which is also wireless. Hard wire alarms are also available but can be costly.

Two good discussions about these detectors can be found at:

- https://www.elprocus.com/working-of-different-types-of-motion-sensors/
- https://central-alarm.com/2017/10/20/5-types-of-motion-detectors/

Trip devices are usually infrared driven or uses "tripwire." Tripwire devices are the oldest type of intrusion detectors, are easily implemented, are low/no cost, and can use a variety of ways to announce intrusions.

Pressure devices can be used indoors and outdoors. Typically they are used indoors to help secure valuable items via the use of pressure plates or pressure sensors. Outdoor uses are generally limited to initiate some form of a trap, or are attached to explosives such as anti-personnel mines.

Heat and Magnetic devices are designed for either interior or exterior use. If used outdoors these devices must meet a higher level of specifications than their indoor counterparts, thus placing them outside the price range of most people. On the other hand, these devices are often used indoors for home security systems.

Other Perimeter Defenses

Plants
One excellent way to control intruders on your property is by planting specific types of plants. You can plants hedges around your property lines, under your windows, and around your entry doors.

The object is to create a barrier consisting of very thorny plants that people would be reluctant to climb through. The thorns need to be between one to 3 inches long. Since these bushes vary depending on climate zones, be sure to pick ones that are compact and yet have tangling properties. Also consider the maximum height that these bushes will get so that you will not have to keep pruning them on a regular basis. Depending on window size you will need at least two plants at the very minimum.

Watering Systems
One of my favorite intrusion deterrents are watering systems that are actuated by a monitoring system such as a motion detector. These systems can be set relative to an intruder's location. My preference is for the systems to go off when an intruder is 1/4 to 1/2 way in to the yard, that way they will get very soaked and retreat.

Exterior of Home
Just as a fence is a perimeter defense around your property, the walls, windows, and doors to your home can also be made into a perimeter defense system. Before discussing each of these elements individually let's consider the ways that most intruders use to breach this outer shell of your home.

All homes have two or more ways that they can be entered:

- Doors
- Windows
- Crawlspace entrances
- Basement/Cellar doors and windows
- Roofs

Doors and windows are by far the most common as they give direct access to the home's interior. Most crawlspaces and roofs do not provide direct access to a home's interior; however basement and cellar doors and windows can be used to enter a home. Each of these entranceways may require different approaches to prevent or slow down an intruder. Let's look at some ways this can be done.

Windows

Homeowners are often advised to keep windows closed and locked, especially at night when everyone is asleep. This is good advice but provides little protection against an intruder who will either break a window pane or cut out a circle of glass with a glass cutter and reach inside to unlock a window. There are five ways to better secure your windows.

1. Install a window stop lock or use a nail to prevent the sashes from being moved.
2. Apply window security film to the inside of each pane of glass.
3. Install a window vibration monitoring system. Glass breaking sensors are not very effective.
4. Install window magnetic switch sensors. Most will not detect vibration or breaking glass.
5. Replace window panes with Lexan and/or double/triple pane windows.

Some people will mount bars over their windows, but this is not a good idea in case you need to get out of a window fact (fire, intruder, etc.). Many window bars are fixed and cannot be opened. If locked, you will waste time trying to find the key to open them.

Doors

According to crime statistics, the most common entry point into a home by intruders is through the home's doorways. Many security experts often blame the physical construction of doorways as the reason why intruders use door more than any other means to enter homes. Construction however is only one aspect as to why doorways are use.

The primary reason is probably psychological. Ever since mankind started living in dwellings, doorways have always been the primary, and in many cases, the only entry point into homes. This has become so ingrained in our psyche that intruders probably think of entry through doors as the first, if not only, entry point.

There are also physical reasons why doors are so often used by intruders. First people often fail to lock their doors. This is especially true if there are children in the home. Along this same line, people often rely on the fat that garage doors are closed and cannot be easily opened from the outside. In this case, people often tail to lock the door leading from inside the house into the garage.

Most homes often do not have quality construction when it comes to exterior doorways. While homeowners follow the security advice to install deadlocks, but they will often go

cheap when buying these and other locks. While deadbolts will provide some security, the major issues are with the door itself and the door frame.

Many exterior doors used in homes are made of wood instead of steel. Wood doors are fairly easy to break through. Since windows are often set in the doors, intruders can easily break the glass and reach in to unlock the door.

In most cases the door hinges often use 3/4 inch screws which provide little resistance to breaking in by attacking the hinge side of the door.

Similarly on the lock side of the door, the latch part on standard door handles with locks is usually 1/2 inch long or less. On deadbolt locks the typical length of the bolt is 1 inch.

.The typical door frame where the latch and/or deadbolt fit into is usually 3/4 inch thick and typically there is between 1/16 to 1/8 inch between the door frame and the edge of the door. When considering these measurements, less than 3/8 of a door latch and less than 7/8 of a deadbolt lock are actually holding the door closed and locked.

With regard to 7/8 of the deadbolt penetrating into a 3/4 inch thick door frame, the hold for the deadbolt has to be drilled through the frame, thus weakening the wood at this point. Additionally the screws used to hold the strike plates in place for both latch and deadbolt locks are 3/4 in long and further weaken the wood around the holes drilled for the latch and bolt.

One more aspect regarding doorways is the construction of the doorway itself. When a home is built, contractors will typically “frame-in” the doorway according to building codes. This generally means that the sides and top of the frame-in will be made using two pieces of 2x4 lumber nailed together. On either side of the frame-in the next ”stud” is usually 4” to 16” away. A good contractor will put a horizontal brace between the frame-in and the next stud, however not many contractors will do this (time and money). This brace is typically centered between the top and bottom of the wall. Ideally there should be to braces. Assuming both a latch and deadbolt (usually installed above the latch) locks are installed the top brace would be at or just above where the deadbolt lock is installed. Similarly the bottom brace would be placed just below or where the latch lock would be.

The frame-in is typically 1” to 1-1/2” wider than the door frame. Contractors do this so that they can “level” and fit the frame to the door. Wood shims are often used to make these adjustments. Once the door frame is centered in the opening and the shims are in place, the contractor will nail the frame into place, often leaving an open space

between the frame and frame-in where the locks will be. While this space should be filled in, it usually is not.

Because of the inherent weaknesses of doors and door frames as discussed, many aftermarket devices are available to increase the security properties of entryways. A Google search in “door security locks” will produce a plethora of links to many different types of locks, locking devices, and security additions. Following are some things you should consider when reinforcing your entryways after your home has been built.

Door frame reinforcement

While the best way to reinforce door frames is to actually replace the frames with steel frame and at the same time fill in the air space between the frame and studs. This however can be costly and messy. Also, unless the contractor starts early the chances are that it will take two days to complete, leaving your home exposed to intruders.

However there are other ways to reinforce door frames that are less expensive, that you can do, and are easier to install.

Method 1. Remove the 1/2 to 3/4 inch screws that hold your hinges and the door’s strike plate and replace them with 3 to 3-1/2 inch screws. This is the cheapest and easiest approach to making your entryway more secure.

Method 2. To step security up a notch, remove the small strike plate that is on the door frame and replace it with an elongated plate. As in method 1 you will also want to use the longer screws and 4 or more of them when attaching the strike plate. This approach distributes the force an intruder may use to pry or kick open the door.

Method 3. The next level of security involves installing a “door reinforcement kit.” When selecting a kit be sure to buy one that is make with quality. Do your research before buying. Some of these kits are so cheaply made that you might as well not install them at all. Security should be your first concern not cost.

Hinges

We have touched a little bit on replacing the hinge screws but there is more that you need to know about reinforcing the hinges on your exterior doors.

In today’s construction world, contractors often order doors and door frames as a single unit. This makes it easier for them to install since they do not have to build the frame themselves. The problem with this approach is that the door and frame makers often use the same type of hinges that are used for interior doors. They may use 3-4 hinges

instead of the two usually found on interior doors, and the hinges may be longer allowing an additional screw or two.

Exterior doors also will open either outward (not as common in current home building but common in commercial building), or inward as in most homes today. Regardless of which way the door open, each has its own security issues.
If a door opens outward, the best way to improve its security properties is to replace its hinges with an exterior piano hinge. The advantage of piano hinges is that they run along the entire height of the door and do not provide any specific points to be attacked by an intruder. While they greatly improve the security on the hinge side of a door there are two issues with them –a quality made piano hinge may be expensive, and a professional installer with piano hinge installation will probably be needed to install it.

There are however four ways to make the typical hinges used for exterior doors more secure. These methods can be used for doors that swing outward or inward.

Method 1. Spot weld the hinge pin to one of the hinge flanges. The drawback if this approach is that you will likely have to destroy the hinge if you ever have to replace the door.
Method 2. Install a "security stud" on the frame side of each hinge. You will have to remove it's opposite screw or drill an additional hole on the door side of each hinge.
Method 3. Replace each hinge with a "setscrew hinge." This method involves either buying a hinge that uses a setscrew to lock the hinge pin to one side of the hinge. The setscrew is hidden when the door is in the closed, or by adapting your current hinges to use a set screw.
To make your own setscrew hinge completely remove a hinge and take it apart. Place a mark the inside of middle of the center or near center barrel. Using an appropriately sized drill bit, drill and tap a hole through one side of the barrel. Reassemble the hinge and insert and tighten the set screw. Reinstall the hinge and repeat the process for all the other hinges,
Method 4. Replace the current hinges with hinges having "non-removable" pins.
Method 5. Replace current hinges with SOSS hidden hinges. This approach will probably require a locksmith to install the hinges. If considering SOSS hinges both your door and door frame should be thick than most normal door. The reason for this need is that the hinges have to be "deeply" mortised into both the door's edge and the frame.
Method 6. Similar to installing the elongated strike plate discussed above, hinge plates can also be installed over each hinge. These plates are usually 12 inches long or longer.

<u>Door locks</u>

With the number and variety of door lock models on the market, selecting the locks for your home can be perplexing. While there are 16 different types of door locks 13 of them are in common use in homes today.

• Knob Locks • Deadbolt Locks • Cylindrical Lever Locks • Mortise Locks • Euro Cylinder Locks • Electronic Locks and Smart Locks • Biometric Locks	• Fail-Secure Electric Strike Locks • Fail-Safe Electric Strike Locks • Magnetic Locks • Keypad Locks • Sliding Door Locks • Remote Control Lock Systems

All of these locks can cost as little as $10 to more than $300. Such a price range clearly indicates that some locks provide very little security while others may provide more security than the door or door frame they are used with. Descriptions of these types of locks can be found at: https://elawtalk.com/types-exterior-door-locks/.

Locks can also be classified as key, keyless, or a combination of the two. As the name implies, key locks use a key to lock and unlock a door. Similarly keyless locks use some other means than a key to lock and unlock doors, while the combination of the two means that the lock can use either a keyless approach and/or a key to lock and unlock a door. Each classification has its own pros and cons.

Key locks. These types of locks have been around for centuries and are the most common of all locks. Generally speaking most of these locks are fairly easy to breach using lock picks or a process called lock bumping. While security has increased with key locks, most people don't want to spend the money to buy a higher priced lock.

Most key locks have used a series of pins since the days of Olde to unlock the lock. Until recently the process has not changed much and there has been little innovation to make the locks pick proof. However a few manufacturers have redesigned the lock's locking mechanisms. Much of this redesign has revolved around the key and the cylinder it fits into. Two of the newer designs involved how the key is physically designed and the use of RFID micro chips embedded in the keys (often used on newer high end vehicles).

One of my favorite key locks is made by the Bowley Lock Company. Compared to the locks in the big box stores, these locks are not cheap and have a starting price of $150.

Keyless locks. By now most of us are familiar with keyless locks. We've seen them in motels and on the shelves of the big box stores. There are different versions of keyless

locks, each with its own pros and cons. Our first introduction to keyless locks used numerical keypads where you needed to punch in a code in order to open the door.

The advantage of numerical pad locks is that you can often program different numerical codes for different purposes. For example you can enter a code for the housecleaners, a different code for guests, or individual codes for family members. The cost of these type of lock is usually based on its features and can cost between $120 to $500+ per lock.

Another popular keyless lock is the key card lock. These locks usually generally use a plastic credit card size “key” to unlock a door. They are usually used in hotels and resort areas. There are two types of key card locks, those that use a magnetic strip or wifi connection to open a door. Because of cost, these types of locks are usually restricted to businesses rather than homeowners. The major advantage of these locks is that the codes used to open the locks can be changes at a moment’s notice.

In a way smart locks are similar to key card locks in that entry codes can be easily changed. However, smart locks are more advanced, and usually interact with a wifi system and cell phone. One major advantage of smart locks is that you can unlock a door before getting out of your car.

In this same class of smart locks are the remote control lock systems where you can lock and unlock a door from essentially anywhere you have internet connection. This is a great feature in case you remember that you have not locked your doors. The drawback though is that you need access to the Internet.

Another class of keyless locks are the biometric locks. These locks use scanning technology to scan fingerprints, palms print, or retinal eye scan. From a security viewpoint, biometric locks can be the most secure locks on the market today. They use a thermal or optical scanner to store the fingerprints of anyone authorized to unlock your door. While there are low cost biometric locks, most quality ones cost $300 or more. Another drawback is that most of them are designed for indoor use.

While keyless locks are virtually “pick” proof, there are three serious issues with them from a security aspect.

In order for keyless locks to work, almost of then require electricity, either directly connected to a home’s or building’s electrical system or batteries. If either of these electrical sources fail the locks will either automatically open or stay closed. Some keyless locks however are designed with standard key entry, which allows lock picking.

Similar to electrical failure, smart locks often rely on wifi or Internet connection. If these connections fail you will have the same situation as if the power went out.

A third disadvantage, relative to physical personal security is that the locks are considerably slower in opening than key locks. Part of this is caused by the physical and electronic designs of these locks, and the other part is caused by the user if they are stressed and need open the door quickly. While you cannot overcome the time it takes for a lock to open you can 0vercome the time it takes for you to initiate the opening of the lock. This is done with a lot of practice, preferably with induced stress. One way to do this is to run in place until your heart is pounding and you are in need of air, then work on getting the door initiation process going.

Other approaches

There are many other approaches used for door security. Among the most common are the chain locks often seen on television and in movies. Slightly better than chain locks are the swing bar locks used in hotels and motels. Barrel or sliding bolts and rim locks are only slightly better than the previous two locks mentioned.

If your exterior doors open inwards, barricade devices make breaching door extremely hard to do and are easy to use. There are three types of devices used for barricading doors.

The first of these devices are security bars. Security bars either

- fit across the entire door about mid-way up or
- they lean at a 45 degree angle as a brace between the door and floor.

When properly installed, both approaches are highly effective at keeping doors shut.

The best ways to secure a door from the inside is to use a door brace. They require no special door modification, are easy to install and easy to remove. They stop the door from being forced opened, and they also prevent the door from being opened if your locks have been unlocked. There are three types of door braces:

1. Door jammers,
2. Half deadbolt or flush bolts,
3. Floor braces

Door jams. These are typically portable devices used when traveling and you want to temporarily prevent a door from being opened. They are essentially a wedge that "jams" the door in place. Some jammers come with an alarm or siren to alert you if they sense any force. Because they are essentially portable devices, they are not a good long-term solution for security.

My favorite jam device is the DoorJammer Portable Door Lock. It costs anywhere between $30 and $70, so shop wisely.

Half deadbolt or flush bolts. These are essentially keyless deadbolts that you either slide into place or flip over onto the door edge. The ones that slide into place are usually found at the top and/or bottom of the door. For French doors they are mounted in a mortise made on the edge of the door. For regular doors, they are mounted on the inside of the door at the top and/or bottom. These devices and be found at most hardware stores and work well with either in swinging or out swinging doors.

Flip over bolts can be used with common door thicknesses. They mount on the door frame. The bolt is flipped over to keep the door in place. These bolts can be placed anywhere on the door frame, but like the door strike plates discussed earlier 3 inch screws should be used.

My favorite flip over bolt is the Defender Security Door Reinforcement Lock which can be found at Ace Hardware or Home Depot. It generally costs between $10 and $15.

Floor braces. There are many manufactures of floor braces, some which are poorly designed and made while are made of quality. Quality braces are usually made of heavy duty aluminum. As the name implies, these braces are mounted at the bottom of the door and the floor. Of all the secondary devices that can be installed, floor braces provide the overall best security.

My two favorite floor braces are

- The NightLock products: Original or Lockdown 1
- The OnGuard Security Door Brace

This is part three of a four part series on making your life safer. Part 4 will discuss security systems and actions to take if your home is breached.